

What is claimed is:

1. A copolymer composition comprising water insoluble graft copolymer particles, wherein the graft copolymer particles comprise:

(a) from 2 weight percent to 90 weight percent of macromonomer, as polymerized units, based on the total weight of the copolymer, wherein:

(i) the macromonomer is water insoluble and comprises from 10 to 1000 polymerized units of at least one first ethylenically unsaturated monomer, no polymerized mercapto-olefin compounds, and less than 5 weight percent polymerized acid-containing monomer; and

(ii) the macromonomer is a macromonomer prepared by aqueous based polymerization; and

(b) from 10 weight percent to 98 weight percent of polymerized units of at least one second ethylenically unsaturated monomer, based on the total weight of the copolymer.

2. The copolymer composition of Claim 1 wherein the macromonomer comprises from 20 to 200 polymerized units of at least one first ethylenically unsaturated monomer

3. The copolymer composition of Claim 1 wherein the macromonomer comprises as polymerized units less than 1 weight percent acid containing monomer, based on the total weight of the macromonomer.

4. The copolymer composition of Claim 3 wherein the copolymer composition further comprises from 0.2 weight percent to 10 weight percent of an acid containing macromonomer, or acid containing monomer based on the total weight of the copolymer.

5. The copolymer composition of Claim 4 wherein the acid containing macromonomer is attached to the surface of the copolymer particles.

6. The copolymer composition of Claim 3 wherein the acid containing monomer is present, as polymerized units, in the acid containing macromonomer at 50 weight percent to 100 weight percent, based on the weight of the acid containing macromonomer.

7. The copolymer composition of Claim 3 wherein the acid containing monomer is present, as polymerized units, in the acid containing macromonomer at 90 weight percent to 100 weight percent, based on the weight of the acid containing macromonomer.

8. The copolymer composition of Claim 1 wherein the graft copolymer comprises a backbone and one or more side chains, wherein the side chains are pendant from the backbone and comprise the water insoluble macromonomer, and wherein the backbone comprises the polymerized units of the second ethylenically unsaturated monomer.

9. The copolymer composition of Claim 1 wherein the first ethylenically unsaturated monomer is an α -methyl vinyl monomer, a non α -methyl vinyl monomer terminated with a α -methyl vinyl monomer, or combinations thereof.

10. The copolymer composition of Claim 9 wherein the first ethylenically unsaturated monomer is methyl methacrylate, ethyl methacrylate, 2-ethylhexyl methacrylate, isobornyl methacrylate, butyl methacrylate, lauryl methacrylate, stearyl methacrylate, styrene terminated by α -methyl styrene, or combinations thereof.

11. The copolymer composition of Claim 1 wherein the second ethylenically unsaturated monomer is selected from the group consisting of acrylate esters; methacrylate esters; styrene; substituted styrenes; olefinically unsaturated nitriles; olefinically unsaturated halides; vinyl esters of organic acids; N-vinyl compounds; acrylamide; methacrylamide; substituted acrylamides; substituted methacrylamides; hydroxyalkylmethacrylates; hydroxyalkylacrylates; vinyl ethers; dienes and combinations thereof.

12. The copolymer composition of Claim 11 wherein the second ethylenically unsaturated monomer is selected from the group consisting of C₁ to C₁₈ alkyl acrylate, styrene, butadiene, and combinations thereof.

13. The copolymer composition of Claim 1 wherein the graft copolymer is a graft copolymer prepared by a method comprising:

(a) forming a macromonomer aqueous emulsion comprising one or more water-insoluble particles of the macromonomer, wherein the macromonomer has at least one terminal ethylenically unsaturated group;

(b) forming a monomer composition comprising at least one second ethylenically unsaturated monomer; and

(c) combining at least a portion of the macromonomer aqueous emulsion and at least a portion of the monomer composition to form a polymerization reaction mixture and polymerizing the macromonomer with the second ethylenically unsaturated monomer in the presence of an initiator to produce a copolymer composition comprising graft copolymer particles.